

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

5 OCT 2005

In re the Application of

Shinichi SOEJIMA

Attn: PCT Branch

Application No. New U.S. National Stage of PCT/JP2004/004928

Filed: October 5, 2005

Docket No.: 125497

For: APPARATUS FOR ABNORMAL DIAGNOSIS OF VARIABLE VALVE TIMING
MECHANISM

**SUBMISSION OF THE ANNEXES TO THE
INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto is a translation of the annexes to the International Preliminary Examination Report (Form PCT/IPEA/409). The attached translated material replaces claim 1.

Respectfully submitted,



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Enclosure of April 14, 2005
International Patent Application No.: PCT/JP2004/004928
Applicant: TOYOTA JIDOSHA KABUSHIKI KAISHA
Our ref: EP 44249

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New claim 1

1. An abnormality diagnosis apparatus (100) that diagnoses
10 an abnormality of an adjustable valve mechanism (120),
which varies a moving characteristic of a valve (16) in an
internal combustion engine, said abnormality diagnosis
device (100) comprising:

an input control signal module that inputs a control
15 signal (step S10) for varying the moving characteristic of
the valve (16);

a theoretical value computation module (140) that
computes a physical behaviour of the adjustable valve
mechanism (120) according to a physical model provided to
20 simulate the physical behaviour of the adjustable valve
mechanism (120) and thereby calculates a theoretical value
of a parameter relating to the moving characteristic of the
valve (16), which is varied by the adjustable valve
mechanism (120), based on the input control signal;

25 an observed value detection module (130) that detects
an observed value of the parameter relating to the moving
characteristic of the valve (16), which is varied by the
adjustable valve mechanism (120), in response to the input
control signal; and

30 an abnormality detection module (150) that determines
whether the adjustable valve mechanism is abnormal or
normal, based on the theoretical value and the observed
value.